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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,301	08/08/2001	Won-Ho Lee	29936/37051	3115
4743	7590	08/07/2006	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP 233 S. WACKER DRIVE, SUITE 6300 SEARS TOWER CHICAGO, IL 60606			MULPURI, SAVITRI	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/924,301	Applicant(s) LEE, WON-HO	
	Examiner Savitri Mulpuri	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 7/29/006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8, 10-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-8 and 10-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to the applicant's communication filed on 5/30/2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-8, 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 6,380,568) in combination with Ishida et al (6,344,396) and Cunningham et al (US 6,479,362).

Lee et al teaches a method of making CMOS image sensor comprising: providing a semiconductor structure, wherein the semiconductor structure includes an impurity region "660" and a gate electrode "640"; forming a first spacer on a first side wall of the gate electrode, wherein the first spacer "680" is overlapped with a portion of the impurity region '660'; forming second spacer "682" on a side wall of the first spacer '680" and forming a third spacer '680" on a second sidewall of the gate electrode and forming fourth spacer 682.

With respect to claims 12-13, Lee et al teaches carrying an implantation to form P- type impurity region "670" in an N-type impurity region "660" to form photo diode and forming floating diffusion region "10, 503,690" spaced away from

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the impurity by a predetermined distance (see fig.1,5 and 7 , line col.4, lines 34-40).

With respect to claims 7, Lee et al teaches forming insulator layer and perform blanket etching to form spacers (see col. 4, lines 30-34).

Lee et al do not teach removing the fourth spacer "682".

Ishida et al teaches forming first spacer "13" and forming second spacer "14" on the first spacer on the source side, and forming third spacer "13" and forming fourth spacer "14" on the third spacer "13" on the drain side and removing the fourth spacer "14", by using photo resist as mask, to form asymmetric CMOS transistors (see fig. 1E and related description). It would have been obvious to one of ordinary skill in the art to remove fourth spacer by using photo resist as mask in the invention of Lee et al to avoid short channel effects due to presence of hot carriers since Lee et al also teaches method of making CMOS transistors (see col.5, lines 5-38).

With respect to claim 8 Lee does not teach forming spacers with thermal oxide. Cunningham teaches forming spacer from thermal oxide (see col.6, lines 34-45). It would have been obvious to one of ordinary skill in the art to form spacers from thermal oxide because thermal oxide or nitride spacers are dense compared to directly deposited oxide or nitride spacers

Applicant's arguments filed on 5/30 /2006 have been fully considered but they are not persuasive. Applicant argues that the reference taken alone or in combination do not teach or suggest as recited by claim 6 at least forming a first spacer on a first side wall of the gate electrode and a fourth spacer on a second

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side wall of the gate electrode, wherein the first spacer is overlapped with a portion of an impurity region and removing the fourth spacer by photo resist pattern covering the impurity region and the first spacer, and also argues that it is not enough that the references teach in the abstract formation and removal of various spacers. Lee et al teaches substantially same process as the process recited in the invention except that removing the fourth spacer by using photo resist as a mask. Ishida et al teaches removing the fourth spacer "14" by using photo resist as a mask. The invention of Lee et al ,as modified by the teaching of Ishida et al, would remove the fourth spacer "680" using photo resist as a mask for the avoiding short channel effects.. The modified invention of Lee et al, as modified by ishida et al, would read the claimed invention as the way the claims are recited.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will


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the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

.Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m. to 4.30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt, can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Savitri Mulpuri
Primary Examiner
Art Unit 2812